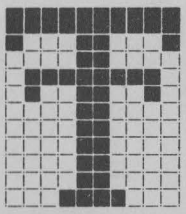

OPERATIONAL MANUAL

VERSION 03

CONTENTS

FOREWORD

INTRODUCTION

SECTION 1 SYSTEMS FACILITIES

1.1 PASSWORD
1.2 DIRECTORIES
1.3 BASIC MAIL
1.4 SEND
1.5 READ
1.6 SCAN
1.7 INFORMATION DATABASE

SECTION 2 ACCESSING THE SYSTEM

2.1 MENUS
2.2 ONCE YOU ARE INTO THE SYSTEM

SECTION 3 PROGRAMMING THE TERMINAL FACILITIES

3.1 ACCESS CODE PROGRAMMING
3.2 TELEPHONE NUMBER PROGRAMMING
3.3 LOG-IN SEQUENCE PROGRAMMING
3.4 FUNCTION KEY PROGRAMMING
3.5 PERIPHERAL FACILITIES PROGRAMMING
3.6 MODEM PARAMETER PROGRAMMING

APPENDIX A
FUNCTION KEY DESCRIPTIONS

APPENDIX B
BBC CODES

APPENDIX C
DISK FILE UP AND DOWNLOADING

APPENDIX D
EXTERNAL FILES ON TCD NUMBERS

APPENDIX E
RML KEY EQUIVALENTS

FOREWORD

Welcome to the Pilot Scheme of the Times Network for Schools. This manual is in draft form and will be modified in the light of comments received from users.

The manual is divided into three sections; the first outlining facilities offered by the software, the second explaining how to access the system and the third showing how to program the terminal facilities to your own specifications.

As a member of the Pilot Scheme, you are reminded that you are not seeing the databases in their final form and as this phase of the project progresses, it is hoped that you will see them developed in line with the wishes of the various sectors of the educational service. However, we need your help and if you have any suggestions for the development scheme, please send them to The Suggestion Box, TCD100020. This is also the mailbox which should be used to send actual contributions to the datafiles.

PLEASE REMEMBER TO PREPARE AS MUCH MATERIAL AS POSSIBLE

OFFLINE

BEFORE LOGGING INTO THE SYSTEM

This will ensure that you keep your telephone charges to a minimum. During the Pilot Scheme, we are using Telecom Gold's own Prime which is also being used by the business world. This could mean that at peak times of the day (9.30 - 10.30 and 15.00 to 17.00) the access of information will be slow. If you experience any difficulties, please do not hesitate to let us know on TCD100020.

Please note that the error correction EPAD facility is not available yet, although your software has the protocol ready for use when the account code is announced.

The 1200/1200 service will be available as soon as the Times Network's own computer is up and running.

For BBC users, there is a program on your disk that allows you to simulate some aspects of computer operation off-line such as logging-in and the electronic mail section. This program is called TUTOR. Enter CH."TUTOR"<CR> to run the program.

INTRODUCTION

The concept of the Network is to create an electronic mail and information network for UK secondary schools which will enable their microcomputers to be linked via modems to the public telephone network. Later, the Network will be extended to primary schools and will act as the blueprint for developing similar systems overseas.

The Times Network for Schools offers a subsidised electronic mail and information service to be linked via modems to the public telephone network.

The aim of The Times Network for Schools is to enhance the standard and quality of education, in order to prepare students to meet the requirements of their future employees and to make them familiar with high technology development - the electronic office, information technology and access to international data bases. A job-finding recruitment service for school leavers will be an important feature and this will be backed by a careers advisory service.

The Times Network for Schools is intended to add interest and enjoyment to the curriculum, to supply a valuable new teaching aid and to foster the spirit of excitement and competition. The Network will also aid the development of extra-curricular activities, such as hobbies and sports, which should be encouraged. The Network will bring together isolated groups who will be able to pool their expertise.

An advisory board system will be established to ensure that The Times Network for Schools meets the requirements of school users and for future development. Members will represent Local Education Authorities and their schools in four or five regions and representatives from The Times Network for Schools.

SECTION 1

SYSTEMS FACILITIES

USERS SHOULD FOLLOW THE INSTRUCTIONS IN SECTION II
TO ADAPT THE SOFTWARE IN THE PACK FOR LOCAL ACCESS.

Once connected the first screen you will see is:

```
        Which service would you like to use?
    You can choose ELECTRONIC MAIL or INFORMATION

    * * * * * * * * * * * * * * * * * * * * * * *
    *                                             *
    *  ELECTRONIC MAIL - Please type in "MAIL"    *
    *                                             *
    *      INFORMATION - Please type in "MENU"    *
    *                                             *
    * * * * * * * * * * * * * * * * * * * * * * *
```

We will now deal with each option; "MAIL" and "MENU", but before this,a word about the password and directories.

1.1 PASSWORD - a key to confidentiality

When signing on to your mailbox, you entered a mailbox ID TCD ... and a password. Your password is the key that unlocks your mailbox and secures the privacy of your correspondence. Other mailbox users need to know only your ID number to send you mail. They do not need to know your password. You may change your password by typing PASSWD after the system sign ">" type PASSWD and following the instructions.

Note: security is important; change your password often. Use 6-8 characters, avoiding obvious words such as your name, your partner's name or your childrens' names.

1.2 DIRECTORIES

Your mailbox is one of several groups of mailboxes used within the system. As a group, you share the same 3-letter prefix, for example TCD, to your mailbox IDs. To obtain the list of all users, you type in "DIR" when the system sign ">" appears.

On the BBC only, to stop and quit long listings, press the COPY key a few times, until the listing stops.

1.3 BASIC MAIL

Your mailbox gives you a workspace where you may, among other things, handle your incoming and outgoing mail. You are simply using the computer rather than a desk top with pen, paper and telephone. This section of the manual should equip you to use the basic facilities of MAIL. It enables you to send mail to other mailbox users and read or scan all that has been sent to you. You may have noticed after entering your mailbox ID at "Please Sign On" that there was something called MAILCALL. This tells you how much mail is waiting for you in your mailbox.

When you have typed in MAIL at the system sign, you will be asked whether you require to Send, Read or Scan Mail.

1.4 SEND

A user may SEND messages of any length to one or more persons. To send a message, it is necessary to indicate who the recipients will be, and the text of the message. You will see the following system prompts:

To:
Subject:
Text:

PROMPTS WHILE SENDING MAIL

"TO" Enter the name or names of the person(s) to receive the message, each separated by a blank space.

Example - multiple names
To:name name name name

Only specific names or TCD numbers are allowed; these names are stored in a system directory.

If your "To" list requires more than one line you may use the "&" at the end of a line and continue your list of names on a new line - up to 500 names allowed.

Example - multiple names using multiple lines
To:name name name name name name name& (end of line)
name name name name

"SUBJECT"

Enter the subject, or title of the message. This one-line description is displayed to the recipient during a READ or SCAN function. The subject line may be up to 120 characters in length. It is also a searchable field which you or the recipients can use to select messages for scanning, reading or other Mail functions.

"TEXT"

Enter the message itself, as you wish it to appear to the recipient(s). You may enter as many lines as you like; each line may be up to 120 characters. You must press a RETURN after each line. The "delete" and "delete line" keys function normally. Inserting blank lines in your text is done by pressing RETURN the appropriate number of times.

After you have finished entering the text, you MUST enter ".SEND" or ".S" on a line by itself. This command tells the system that you have completed your text and your message will then be processed. You will receive verification of the messages being sent:

```
Name - Sent
Name - Sent (etc)
```

TEXT FILES

To send the contents of a text file you already have on disk, enter <TX-FILE> (<SHIFT-f5> on the BBC) followed by the name of the file on the disk; terminate with a <CR>.

The file will now be transmitted on-line, with the contents echoed to the screen in double line spacing. (Text will, however, be stored correctly at the computer end.)

When all the file has been transmitted, a message will be displayed on the screen. Enter on the keyboard: <CR>.SEND<CR>

The following illustrates a session of sending mail

```
>MAIL

Send, Read or Scan:SEND (May be abbreviated as S)
To:TCD100001 TCD100004 TCD100012
Subject: FRIDAY ADVISERS MEETING
Text:
At Friday's meeting (8.00am) we will outline the New Foundation.
If there is any reason why you can't attend, please let me know.
.S

TCD100001 - Sent
TCD100004 - Sent
TCD100012 - Sent
To: QUIT (Quit is used to exit the mail system)
```

SEND OPTIONS

A number of options are available in reply to the basic prompts of "To" and "Text".

a) Options at "To"
==========

As well as entering names at "To", you may use one or more of the following options BEFORE the name(s) to which they will apply.

CC — Send a "carbon" (courtesy) copy of the message to specified person(s).

Example - carbons to TCD100002 and TCD100003
To:TCD100001 CC TCD100002 TCD100003

BC — Send a Blind Copy of the message to specified person(s). This differs from a Carbon Copy in that no other recipient will know the BC recipient received a copy of the message. The BC recipient will see the ENTIRE "To" list.

Example - Blind copy to TCD100006
To:TCD100001 CC TCD100002 TCD100003 BC TCD100006

AR — Send message Acknowledgement Requested. As soon as the recipient(s) reads the "header" of the message, an acknowledgement is send automatically back to the sender as a mail item.

Example - Acknowledgement requested

To:TCD100001 CC TCD100002 TCD100003 BC TCD100006 AR TCD100007

RR — Send message with Reply Requested. When the recipient(s) read the message, they are automatically put into the "reply" mode and prompted with "Text".

Example - Reply requested of TCD100007
To:TCD100001 RR TCD100007

EX — Send message Express. The item sent will go to the "top" of the person's mailbox and the "Mail Call" output after the recipient's sign-on will specify that Express items are waiting to be read. Additionally, if the recipient is using the system at the time when the Express item is sent to him, a message will appear on his terminal "Express Letter Call from (DIR name)" with a "beep".

Example - Express message to all
To:TCD100008 CC TCD100006 TCD100009 EX

NOSHOW — Do not show "To" list. The system usually displays the "To" list to the readers, unless the NOSHOW option is used e.g. for long distribution lists. Note that the recipient of a NOSHOW does not see the list, whereas the recipient of a BC does.

Example - C Brown sending a message with the NOSHOW option.
To:TCD100020 TCD100039 TCD100056 NOSHOW

All the recipients would see a heading of:

From:TCD100004 Posted (time) (date) Sys no (lines)
Subject:Test of Mail System
Without NOSHOW (system default), the header looks like:
To:TCD100020
To:TCD100039
To:TCD100056
From:TCD100004 Posted (time)(date) Sys no (lines)
Subject:Test of Mail System

HELP — Print available options

QUIT (or Q) — Quit and exit from Mail System

NOMORE — Inhibits the prompt of "-More-" for that session of Mail.

HARDCOPY — Inhibits the prompt of "-More-" which occurs every 23 lines for that session of Mail.

MORE — Reinstates the first prompt of "-More-" for that session of Mail.

Multiple "To" options

More than one option can be used as shown in the examples. You may also use multiple options for the same recipient. The options are simply strung out BEFORE the recipients to which they apply. Stringing them out at the END of your "To" list will mean the options are global and apply to ALL recipients.

Example EX AR RR for TCD100070 TCD100071 CC for TCD100065
To:EX AR RR TCD100070 TCD100071 CC TCD100065

b) Options at "Text"

Various options and commands can be executed while inputting the Text of your message. To differentiate an option or a command from lines of Text, it MUST BE PRECEDED BY A DOT (.) and be the ONLY information entered on that line. The DOT must be the first character entered on the line. Note that all the "To" options are again available as Text "dot" options - so that you can modify your "To" list.

.S or .SEND	Send the message - signifies the end of Text mode. Use only AFTER you have completely finished entering your Text and using any of the other options below.
.Q	Quit - abort message and exit from Mail system.
.HELP	Print available options.
.TO name	Add one or more names and/or options to your "To" list. To remove names from your list, use a hyphen (.To-name -name) before the name.
.TO	(Without name). Cancel message, return to "Send Read or Scan"
.CC name	Add CARBON COPY option for one or more names.
.BC name	Add BLIND COPY option for one or more names.
.AR	Add ACKNOWLEDGEMENT REQUESTED option for one or more names. If no name is specified, the Acknowledgement Requested option will apply to all recipients of the message.
.EX name	Add Express option for one or more names. If no name is specified, the Express option will apply to all recipients of the message.
.NOSHOW	Add the NOSHOW option.
.SU abcd	Replace SUBJECT line with abcd
.DISPLAY	Display current TEXT. May be abbreviated to .DI
.DISPLAY TO or .DI TO	Display current "To" list.
.DISPLAY SU or .DI SU	Display current "Subject"line
.DISPLAY HE or .DI HE	Display current Header ("To" and "Subject" lines.
.DISPLAY DIR or .DIS DIR	Display current directory of names.

1.5 READ

When reading messages received, you are shown a "header" consisting of usually three lines of information about the mail item:

```
To:   (recipient)
From: (sender)      Posted (date) (time) Sys No (No
                                    of lines in message)
Subject (message header)
```

The header information was created at the time the message was sent to you. Once the header is displayed, a number of further options are available:

```
READ      the text of the message
REPLY     to the sender
FORWARD   the message to other people
FILE      the message for later retrieval
Leave the item in your mailbox and continue to the
NEXT item
DELETE    the message
```

PROMPTS WHILE READING MAIL

After entering "READ" or "R", you will be shown all your mail, one item at a time. The oldest entries will appear first except for those items sent Express - Express items always appear at the top of your mailbox.

The Header line of an entry is printed first, showing to whom the message was sent, who sent it, when it was sent, the system number from which is was sent, the number of lines in the TEXT of the item and its subject line. You are then given the following prompts:

```
-More-            (after the Header and before the Text is
                   printed)
-Action Required- (after the Text has been printed
```

```
TELECOM GOLD Automated Office Services 18.3A(81)
On At 13:42 25.9.84
Last On At 8:05 25.9.84

Mail Call (3 Unread 1 Unread Express Total 4)

>MAIL
Send, Read or Scan:READ (May be abbreviated to R)

     To:TCD100004
   From:TCD100006                Posted Fri 25 Sep 84 Sys 84 (3)
Subject:Reply to CASABLANCA

-More-NEXT
```

To:TCD100005
To:TCD100006
CC:TCD100004
From:TCD100007 Posted Thu 24 Sep 84 Sys 84 (3)

-More-<CR>

The Regular Friday Meeting has been cancelled.
We will wait for Warren to return since he has
the latest news on the Project

Action Required:

READ OPTIONS

a) Options at -More-

This prompt occurs for two reasons. First, it appears after the header lines and allows you to make a decision as to whether or not you want to see the Text of the message.

Secondly, the mail system assumes you are using a screen terminal and pauses every 23 lines (each time the screen fills) to give you time to read the text. The same prompt of "-More-" is offered at each pause.

The following options are normally used at any prompt of "-More-"

RETURN key or YES Display (or continue displaying) Text of message.

NEXT Skip the Text and go on to the NEXT message. The item will remain in your mailbox.

NO Skip the Text and go to "Action Required"

Q Quit and exit from Mail System

D Delete Message. This is normally used ONLY IF you have read the message during a previous session.

HARDCOPY Inhibits "-More-" prompt every 23 lines

NOMORE Inhibits first "-More-" prompt after Header

IN ADDITION the options available at the prompt Action Required are ALSO available at "-More-"

b) Options at Action Required

This prompt keeps appearing until you decide either to leave the message in your mailbox or to delete it. Here you would normally enter "D" or "DELETE" so that it does not appear the next time you read your mail. However, remember to file the message first if you want to retain a copy. If you want to leave the message in your mailbox, the system goes on to display the header of your next mail item and the cycle repeats.

If there is no more mail to be read, the computer says "End of Mail" and you are returned to the "Send Read or Scan" prompt.

There are further options that can be performed at "Action required". The following is a list of all the options available:

Q	Quit, exit from the Mail System. Item is left in mailbox.
HELP	Print available options
RETURN or NEXT	Go on to the next mail item. Item is left in the mailbox.
DELETE	or D. Delete item and proceed to next message.
AGAIN	Display the text of the message again.
REPLY	or R. Reply to the sender. The system knows to whom the response should go and you receive a prompt of Text (just like the TEXT mode in sending mail). After entering the Text of your Reply, you MUST enter ".S" or ".SEND" on a line by itself to indicate that you have finished your reply. All Text "dot" options are available to you here.
AP REPLY	Append Reply. Reply to message and append original message to reply.
FO name	Forward the message to other people, who you specify. You may forward to several names by stringing them out and separating each name with a space. If you do not enter any names the system will prompt you with "To". You will then be prompted with "Comments", which is exactly like the "Text" prompt of Sending mail. All Text "dot" options are available. Use ".S" or ".SEND" when you have finished. The recipient receives the original message followed by your comments.

DOWNLOADING TEXT

Ensure there is a disk on the drive. If the text to be downloaded is long, ensure that the disk is reasonably empty otherwise you may get a "DISK FULL" message half way through your work.

The general procedure to save a text file is as follows:

1. Sign on to the system and get to the section, page or message you want to save. Do not call the information yet.
2. Press <RX-FILE> (<SHIFT-f6> on the BBC). This opens a disk file for saving on the disk.
3. Enter a name of file for the text to be stored under. Any name will do as long as it has fewer than 8 characters.
4. Recall the data from line. Note the light on the disk drive comes on as the data is stored.
5. When all the data has been received, press <END-DISK> (<F6> on the BBC, to close the file.

The last operation (closing the disk file) is important, the program will store all incoming data to disk until the file is closed. The file will be closed automatically if the program is exited in the normal way, i.e. via one of the menus. If the program is aborted with the BREAK key, the disk directory may not be updated correctly and data may be lost on the disk.

1.6 SCAN

Scanning offers a quick way of looking at the Headers only of your messages or message files before looking at the Text. Options are available to select from current mail or filed mail; also by person, date or words contained in the Subject or Text.

SCAN OPTIONS

Options at "Read or Scan"

You may answer "Read" or "R" which will initiate the reading of the scanned items - one at a time with all the normal prompts of "-More-" and "Action required". In addition, however, you may specify the order in which you want to read the scanned items. Note the following options for reading scanned items.

READ or R. Read all scanned items one at a time

READ ALL Read all scanned items WITHOUT any prompts or pauses for "-More-" or "Action Required". The state of each item is not changed e.g. it is not deleted or forwarded.

READ DALL — Read all scanned items WITHOUT any prompts for pauses and DELETE the items.

READ DAM — DELETE the scanned items WITHOUT reading them (Delete All Mail).

READ B — Read in descending order - may also be used after specifying item numbers or ranges, described next.

READ 6 — Read item specified e.g. item number 6.

READ 3 5 — Read specified items in order listed.

READ 3-7 — Read a specified range of items e.g. 3 to 7 inclusive.

READ -6 — Read up to and including specified items number e.g. up to number 6.

READ 4- — Read from specified item onwards e.g. from number 4 downwards.

REST — Read rest of scanned items. Used after specifying item numbers or ranges. For example:

Read or Scan:READ 3 2 4-6 REST

If there had been 8 scanned items, this option would read them in the order 3, 2, 4, 5, 6, 1, 7, 8. The word REST indicates that all the remaining scanned items are to be read in ascending numerical order.

NOTE: The options listed here contain numbers and/or ranges (e.g. READ 6) to illustrate the use of the options. In practice, a list of scanned items is assigned numbers, from which you can select the items you wish to read, delete, reply to etc. This also applies to the other commands listed below where an item number has been used.

Besides the above read options at "Read or Scan", the following options are available:

SCAN — Scan again with different options.

FO 2 name — Forward specified number to "name(s)". This can also be accomplished by READing the item first, then using the FO option at "-More-" or "Action Required".

REPLY 4 — Reply to sender of specified item. This can also be done by READing the item first, then using the REPLY option at "-More-" or "Action Required".

DELETE 1 2 3 4 Delete specified items. This can also be done by READing each item first then using the DELETE option at "-More-" or "Action Required".

INFORMATION DATABASE

When you have signed on, you remember that you have the choice between ELECTRONIC MAIL and INFORMATION. To obtain INFORMATION, you type MENU and you obtain the menu shown below:

INFORMATION

OPTION	CODE		OPTION	CODE
COMPETITIONS	A	*	ORDER FORMS	H
CURRICULUM	B	*	SCHOOL RESOURCES	I
EDUCATIONAL REPORTS	C	*	SOFTWARE	J
HARDWARE	D	*	SPORTS	K
LEISURE	E	*	CAREERS DATABASE	M
NEWS/NOTICEBOARD	G	*	EDUCATION SUPPORT ORGANISATIONS	0

These categories will be filled as information becomes available from sponsors and users in the pilot scheme. If you have a contribution to make to these blocks of information, please send it to TCD100020. This is also the help number should you have any queries or problems, especially in CURRICULUM (B), where a number of LEAs have already set up working parties to prepare information for the files. If you would like to prepare information yourself, please let us know on TCD1000020, so that we can co-ordinate the information and ensure that there is no duplication of effort. Below is listed the proposed content for each option and a few of these have been completed, but remember that we are seeking your own suggestions.

>A General competitions and a list of those in specific sections of the curriculum.

>B Information relating to all areas of the curriculum.

>C HMI reports, publications from HMSO and others from similar bodies.

>D Information about the latest hardware relating to various computers and accessories, e.g BBC, RML.

>E After-school activities to be developed by demand. Files are being prepared at present relating to chess, karting, conservation and birdwatching.

>G This is divided into two parts.
NEWS will give you an update on what is actually happening on the system and it is proposed that this will be updated weekly.

PRPOST is an area of the system where individual mailbox holders can contribute. You will notice at the present there are only a few categories and you can write any messages under these headings. If you would like to suggest further headings, please let us know on TCD100020.

>H Order forms which may be connected with other areas of the system.

>I Information on school books, stationery, furniture, equipment and catering.

>J Software programs and information, listed according to microtype.

>K Organised sports in schools. At present you will see there are five different sports on the system.

>M The Careers Database is keyword searchable. Entering STOP will take you out of the Search Read or Scan, and entering HELP will restore the Careers Database Menu. These codes can be programmed into the function keys <F0> and <F2> if desired.

>O Information of Education Support Systems. Please remember this is a capital O, not a zero.

On these databases, <CTRL> plus S will stop the information scrolling past, and <CTRL> plus Q will re-start it.

To abort long listings use the COPY key only on the BBC.

On the RML, enter TERM PAUSE<CR>. This will cause the screen to stop after every 24 lines, use <CR> to continue of Q<CR> to quit.

SECTION 2
ACCESSING THE SYSTEM

ACCESSING THE SYSTEM

BBC MACHINES

Place the disk containing the communications program in disk drive 0. The original software is supplied in 40 track single sided disks. Ensure your drive confirms to this format.

Press the <SHIFT> and the <BREAK> keys simultaneously to load the program from disk. If the auto-load facility is not enabled (or if you want to restart the program), enter:

*TTNS<CR>

(Now go to section 2.1 MENUS)

RML MACHINES

After loading the operating system in disk drive A, load TTNS disk in drive B. The access program is called T.COM.

At the system sign A> enter "TYPE READ.ME". Instructions will be shown on the screen on how to use the program.

2.1 MENUS

Wait a few seconds for the program to load. If the program has loaded correctly, the main program menu will be displayed

---

THE TIMES NETWORK FOR SCHOOLS

Main Menu

1- Connect to computer
2- Disconnect line
3- Return on-line
4- Edit telephone numbers
5- Edit function keys
6- Operating system commands
7- Return to system

Please enter choice

To establish a connection to the computer, enter "1". The terminal will now show the following display:

THE TIMES NETWORK FOR SCHOOLS

Connect to Computer

1- TTNS (1200/75)
2- TTNS (1200/1200)
3- TTNS (PSS 1200/75)
4- TTNS (300/300)
5- TTNS (EPAD 1200/75)
6- Prestel
7- Manual Dial

Please enter choice

Six options are offered for connecting to the computer. The numbers in brackets refer to the line speeds on that particular port. Note that the actual computer names and telephone numbers are stored in a "personalised" parameter file, therefore your screen may show different names from those shown above.

Now enter the number corresponding to the service desired. As a rule of thumb, choose as follows:

For interactive work (looking at mailboxes, sending and receiving simple messages etc.):

Direct 1200/75 if you are in London
PSS 1200/75 if you are outside London

For file transfers (uploading and downloading of programs and other files):

EPAD 1200/75 from anywhere

If you want to access a number that is not on the list, use the manual dial option (7 on the list). When the prompt "now dial telephone number" appears, lift the telephone handset and dial the computer number by hand. When the computer tone is heard, enter the number of the service required. This number refers to the displayed list and can be one of the following:

1- For a direct dial communication at 1200/75
2- For a direct dial connection at 1200/1200 pseudo-duplex
3- For connection via the PSS network at 1200/75
4- For a direct dial-up connection at 300/300
5- For a connection to EPAD
6- For a connection to PRESTEL

If the connection was successfully established, the screen will clear and the remote computer will reply. At this stage the terminal will send the automatic LOG-IN code if programmed (see Section III Programming the Terminal Facilities). If the automatic log-in sequences have not been programmed, enter them by hand and follow the instructions on the screen.

1-, 2- and 4- Direct Connection

A direct connection is established when the terminal is connected directly to the mainframe via the public network. The connection is achieved by the terminal software dialling up one of the 30 telephone numbers connected to the user ports at the mainframe end. All the 30 ports are located in a single building in London. If you are in the London area, a direct call to the computer is possibly the quickest way of connecting to the system.

Once the connection has been established, the TTNS computer will request the user to enter a user identity. If the terminal has been programmed to transmit a sequence, this will be done automatically. If you have chosen to sign on manually, proceed as follows (<CR> refers to the <RETURN> key):

Terminal dials the computer ...
Screen clears; TTNS computer replies ...

The computer replies	Your response
The Times Network for Schools	screen message from TTNS computer
Please sign on:	TTNS computer requests user ID Enter your ID number here as ID TCDXXXXXXX<CR>
Password:	Computer requests personal password Enter your password here, followed by a carriage return.
Welcome to ...	You are now connected to The Times Network for Schools

Note that the password does not appear on the screen. If you happen to make a mistake when typing the password, the whole sequence will be repeated, you will be asked to re-enter your ID.

3- Via PSS

Users outside the London area do not need to make a long distance call to one of the Direct Access London numbers. A local call to a PSS (Packet Switched Stream) node will give the same result.

PSS is a data network operated by British Telecom. The PSS network has a large number of user access ports (PADs) located throughout the UK offering local telephone call access to its users.

Connection to the TTNS computer via the PSS is somewhat more complicated than a direct connection. This is because extra user codes (addresses) have to be entered by the user to define "who is calling" and "who is being called".

The terminal will normally transmit a preprogrammed sequence containing all digits required. If manual access is required, proceed as follows:

Terminal dials up the PSS telephone number ...
Connection is established, screen clears ...

The computer replies	Your response
	*Type in <CR><CR>A6<CR><CR>
NUI?	PSS PAD requests Network User ID
	Enter your PSS User ID: NTLGOLD901TYM<CR>
NUA?	PSS PAD requests Network User Address
	Enter TTNS address: A21920100400<CR>
Please Log-in:	Enter your TTNS ID here
Password:	Enter your 6-character password
Welcome to....	You are now connected to The Times Network for Schools

Note that in this case the password may be echoed back to the terminal. The response in PSS mode will be somewhat more jerky than using a direct connection.

* BBC users can enter <CR><CR>D2<CR><CR> instead of <CR><CR>A6<CR>CR>.

5- and 6- Via the EPAD

The EPAD is a special PSS port which offers and error correction facility. The EPAD facility will be required when critical data such as software programs or important text files are to be sent to the computer (up-loaded) or received from the computer (down-loaded). It is also possible to use the EPAD connection for standard interactive work.

Connection via EPAD is somewhat similar to that of an ordinary PSS connection. For manual access the procedure is as follows:

Terminal dials up the EPAD telephone number ...
Connection is established, screen clears ...

N-A?	PSS EPAD requests the Network User Address. Enter the TTNS address: N-A21920100400<CR>
Please Log-In:	Enter your TTNS ID number here as ID TCDXXXXXX<CR>
Password:	Enter your 6-character password
Welcome to ...	You are now connected to The Times Network for Schools

2.1 ONCE YOU ARE INTO THE SYSTEM

Once you are into the system, the welcome message from the computer will be displayed.

You can exit the system by typing "OFF" when the TTNS computer prompt of ">" appears. The computer will then drop the line and show the time spent online, plus other statistics. Now press the MENU (disconnect) key (function key <f8> on the BBC). This will drop the line and display the main menu.

It is possible to drop the connection by pressing the MENU (disconnect) key at any time. This is not recommended as the computer will take some time to realise that you have disconnected, and it will make reconnection during this time impossible.

It is also possible to exit the communications program to the operating system (BBC or CP/M) without dropping the line. This is achieved by pressing the MENU (online) key (Function key <f9> on the BBC). You can exit the operating system for example to run a file conversion program etc, and return to the communications program at any time. When the main menu is shown, enter 3 to return on-line. Remember that all the time you are connected online, time charges are incurred even though your computer is not sending any data.

SECTION 3

PROGRAMMING THE TERMINAL FACILITIES

SECTION 3

PROGRAMMING THE TERMINAL FACILITIES

A number of facilities can be programmed by the user in the software; this allows the terminal to be "personalised" for a particular location or user. The facilities are:

1. Up to six different telephone numbers for computer access.

   For each computer access number

   - A name or mnemonic to identify the service
   - Screen format (80 column VDU or 40 column viewdata)
   - Line speed (300 or 1200 bps)
   - "sign-on" character string sent to computer at log-in

2. Six character strings each associated with a single key depression. These strings are for frequently used system commands (e.g. "MAIL SCAN UNREAD"). A single key depression causes the whole string of data to be sent to the computer.

3. Peripheral facilities, including

   - Type of modem used
   - Suppress LF code sent to printer
   - Allow the transmission of XON and XOFF codes for flow control
   - Allow the reception of XON and XOFF codes for flow control

3.1 ACCESS CODE PROGRAMMING

From the main menu, enter option 4. The screen will now display:

```
THE TIMES NETWORK FOR SCHOOLS

Programming Telephones

1-  Direct (1200/1200)
    B00    8372844
2-  Direct (1200/1200)
    D00    2788969
3-  PSS    (1200/75)
    B00    07536131
4-  Direct (300/300)
    A00    2784355
5-  EPAD   (1200/75)
    B05    7236638
6-  PRESTEL (1200/75)
    B22    618

$ to save to disk
Please enter choice
```

Note that if your terminal has been reprogrammed, it will show a different set of telephone numbers and access codes.

To programme a particular access code, enter a digit from 1 to 6. This will select one of the options for reprogramming. The screen will now show:

```
THE TIMES NETWORK FOR SCHOOLS

Name: DIRECT (1200/1200)
New Name:


Use ~, ^ or ||M for <CR>, see manual
Enter new text if required
```

You can now enter your own text describing the computer service associated with this combination of parameters.

The text you enter will only be used on the "Connect to Computer" display menu and not sent to the computer or used in any other way. The purpose of this entry is to act as a reminder or mnemonic to the user when selecting a particular service.

Up to 30 characters can be entered. Use the <backspace> or <delete> keys to correct any mistakes. To terminate the line, press the <CR> key (ignore the "Use ~ ..." message for the moment). If no change in the existing text is required, enter <CR> without entering any text.

3.2 TELEPHONE NUMBER PROGRAMMING

The screen will now show

THE TIMES NETWORK FOR SCHOOLS

Name: DIRECT (1200/1200)
New Name: (name entered here)

Telephone: 8372844
New number:

Use ~, ^ or ||M for <CR>, see manual
Enter new text if required

A new telephone number can be entered if desired. To skip, enter a <CR> without typing any digits.

Ensure that the new telephone number you enter contains only digits, no spaces are allowed between numbers. With some exchanges, an interdigit delay is required (i.e. a time rest between digits dialled. Use the ";" key as a 2 second delay gap. For example: 9;8372844 would dial 9, pause for a two second delay then dial the rest of the numbers.

A ; before the number can be used to program the modem to ignore dialling tone (necessary with some exchanges) before dialling out.

3.3 LOG-IN SEQUENCE PROGRAMMING

The screen will now show:

```
THE TIMES NETWORK FOR SCHOOLS

Name: DIRECT (1200/1200)
New Name: (name entered here)

Telephone: 8372844
New number: (number entered here)

Modem: B00
A=300   B=12r/75t  C=75r/12t  D=12/12
0=80col 1=40col    2=viewdata
1=8+1   2=7+even   2=7+odd    5=EPAD
Enter 3 characters:B00

Log-in:^^CALL84^\ID ABC0001^
Enter:

Use ~, ^  or ||M for <CR>, see manual
Enter new text if required
```

The log-in sequence is the character string sequence that will be sent to the computer only once during call set-up. The Log-in sequence usually consists of all the passwords, ID and access codes required the access the service. The last character sequence (the user's secret password) can be incorporated or left out for added security.

The Log-in sequence can be up to 79 characters long. The <backspace> or <delete> keys can be used to correct mistakes. A number of characters have special meaning:

^ or ~ (displayed as ÷ on the BBC) is used to denote the return key (entering the return key would terminate the sequence)

|| followed by a character is used to denote <CTL>+character. For example, ||J is the line feed code.

\ (displayed as 1/2 on the BBC) is used to introduce a time delay when sending the sequence. The terminal will wait for all received data to end and then send the next character after 2 seconds. Time delays are essential on certain

occasions where a prompt from the computer must be received before sending the next character.

{ (displayed as 1/4 on the BBC) turns the on-line printer on. All received data will be printed as well as displayed on the screen.

} (displayed as 3/4 on the BBC); turns the printer off.

For example, the standard log-in sequence ^^\CALL84\^ID TCD1000000^ means send two <CR>, wait for all incoming data to end (the welcome message in this case), wait two seconds, send "CALL 84<CR>", wait for all incoming text to end (the "Enter user ID message"), and after another 2 seconds send the text "ID TCD1000000<CR>"

3.4 FUNCTION KEY PROGRAMMING

Up to six preprogrammed string sequences are available. These string sequences are transmitted by pressing a single button (the red function keys <f0> to <f5> on the BBC). See Appendix A for Function Key Description.

The function keys can be programmed with any string sequences defined by the user, alternative LOG-IN codes, most used message strings such as "MAIL SCAN UNREAD" messages etc.

Each sequence can be up to 79 characters long. Some characters have special meaning (see section above in programming LOG-IN codes) and can be used to enhance the versatility of the terminal. For example, the sequence MAIL READ U^{\}OFF^ will automatically print all incoming mail, and when finished log off the system.

To program the function keys, enter 5 when in main menu. The screen display will be as follows:

```
THE TIMES NETWORK FOR SCHOOLS

        Program function keys

        1-  ^^CALL *$^
        2-  MAIL SCAN^
        3-  ^NEWS^{\}
        4-  MAIL SEND^
        5-  MAIL SCAN^
        6-  OFF^

    Use ~, ^  or ||M for <CR>, see manual
    Enter number required:
```

Entering a digit from 1 to 6 will select the sequence for programming, enter a <CR> without any text if you do not wish to change the sequence or the wrong number has been entered. Enter the whole sequence and use the <backspace> or <delete> key to correct any errors. An empty sequence sends nothing to the computer.

To save the sequence, return to the main menu with a <CR>. Choose option 4- Programming Telephone Numbers, and press $ (SHIFT plus 4) to save to disk.

3.5 PERIPHERAL FACILITIES PROGRAMMINNG

Printer Line Feed Control

The program as supplied will drive a standard 80 column printer with standard carriage return and line feed sequences. If your printer does not produce correct copy, i.e. not line feeding correctly or if double line spacing is produced, then the program will need to be modified. Hold the <control> key down and press <f7> momentarily, this sets the program to ignore outgoing line feed characters. Try the printer now. If the printer now works correctly, return to the main menu (with the <f8> key) press 4 to enter the programming menu, and press "$" to save this new updated version of the software to disk.

XON/XOFF control codes

The program is set to respond to incoming XON/XOFF commands and to send XON/XOFF codes for flow control. The BBC only needs to use XON/XOFF when the printer is set to print all data coming on-line, the software is fast enough not to need the use of flow control at other times, even when writing to disk. If the XON/XOFF facility is not required for some reason, hold the <control>key down and press <f6> momentarily. Do not forget to store the new version of the program to disk (see SAVING THE MODIFIED VERSION, below).

SAVING THE MODIFIED VERSION

1. BBC All the programmed values will be lost if the communications program is terminated or aborted without saving the changes to disk. The software will save all values and parameters in a disk file called TTNSPAR. To save to disk, enter the access code programming menu (enter 4 from the main menu), then enter "$". Any old version of TTNSPAR will be lost, so if you want to save a previous version of TTNSPAR (which may contain access codes for a different computer for example) you must rename it using the standard disk filing commands available on the BBC or RML. As an example, to rename TTNSPAR to TTNSOLD:

```
>*RENAME TTNSPAR TTNSOLD<CR>
```

2. RML To save the updated version on the RML, return to CP/M (option 6 on the main menu), then enter

```
A>SAVE 60 TTNS.COM<CR>
```

3.6 MODEM PARAMETER PROGRAMMING

The screen format is:

```
THE TIMES NETWORK FOR SCHOOLS

Name: DIRECT (1200/1200)
New name: (name entered here)

Telephone: 8372844
New number (number entered here)

Modem: B00
A=300   B=12r/75t  C=75r/12t  D=12/12
0=80col 1=40col    2=viewdata
1=8+1   2=7+even   2=7+odd    5=EPAD
Enter 3 characters:B00

Use ~, ^  or ||M for <CR>, see manual
Enter new text if required
```

A three character sequence is used here to program the line speed, screen format and line protocol. If no change is required to the existing format, enter <CR> without typing any other characters. If the sequence needs to be modified, ensure that you know the technical details of the line connection.

The codes are as follows:

FIRST CHARACTER, LINE SPEED i.e. the speed or type of modem used by the computer. Character combinations are:

- A- for 300/300 bps V21 modems (the standard 300 bps modem)
- B- for 1200/75 bps V23 modems (as used in viewdata terminals)
- C- for 75/1200 bps V23 modems (computer end of B above)
- D- for 1200/1200 pseudo-duplex modems. This service is only available with DACOM2123 modems.

SECOND CHARACTER, SCREEN FORMAT. Character combinations are:

- 0-80 x 24 b/w screen display standard teletype codes
- 1-40 x 24 b/w screen display, standard teletype codes
- 2-40 x 24 7 colour display, viewdata format codes

Note: Some RML machines can only support 40 column displays. Also Viewdata will be displayed on GREY SCALES on the RML and not in colour.

Note that the screen format can be changed "on the fly" using the function keys on the BBC as follows:

SHIFT<f0> 80 columns
SHIFT<f1> 40 columns
SHIFT<f2> 40 columns viewdata mode

THIRD CHARACTER, PARITY SELECTION. Character combinations are:

0-8 bits, no parity.	Used for most cases
1-7 bits plus even parity.	Used for PRESTEL access
2-7 bits plus odd parity.	Not used at present
5 block format date.	Only to be used with EPAD

*as an example, the sequence "B00" will set up the terminal for a 12/75 modem, 80 column display and no parity checking.

APPENDICES

APPENDIX A

FUNCTION KEY DESCRIPTION

The red function keys on the BBC computer can be used to control the general operation of the terminal. Unlike the displayed menus, which direct the user to a particular operation (go on-line or program the telephone numbers) the function keys can be used at any time.

There are ten red function keys on the BBC computer, thus giving ten separate commands. If the <SHIFT> key is pressed at the same time as any of the keys, an extra set of ten commands are obtained, giving a total of twenty functions. These are listed below:

<f0> to <f5> Each one of these keys will send a "preprogrammed" sequence to the computer. For example <f1> could have been programmed with the sequence "MAIL SCAN UNREAD". This allows for single key generation of frequently used commands to the computer. Each key can be programmed by the user with a string of up to 47 characters. To program any of these keys, return to the main menu and enter 5. Section 3 PROGRAMMING THE TERMINAL FACILITIES describes a step-by-step procedure for programming a particular key, including all the options available. <f4> and <f5> have special extra significance. <f5> can be used to store an operating system string that will be obeyed when <CTL-f9> is entered. <f4> can be used to store a string that will be printed as a header on printer output.

<f6> <CLOSE DISK FILE>: This key is used to terminate the saving of incoming data to disk (see <SHIFT-f6> below). Entering <Shift f6> causes all incoming text from the computer to be saved to a disk file. The command <f6> is used to tell the computer to save no more data and to "close" the file, that is, to ensure the file is stored correctly on the disk and its name is entered in the directory. Files are automatically closed when you terminate an on-line session and when you return to the main menu. Files will not be closed properly if you abort the program without going via the main menu i.e. by switching off the machine or pressing BREAK. In either case, some or all of the incoming data may be lost.

<f7> <PRINT OFF>: If the <PRINT ON> command was previously given (see <SHIFT-f7>, <f7> will stop the printer from printing all incoming data.

<f8> <MENU -disconnect>: This key is used to return to the main menu and disconnect the telephone line at the same time. Use this key when you have finished working on-line and want to disconnect the line.

<f9> <MENU-on-line>: This key is used to return to the main menu but still leave the telephone line connected to the computer. This key is only to be used if you need to return to BBC BASIC to perform an operation (such as renaming a file) which will require you to return on-line immediately to continue your work. Remember that all the time your computer is connected to the telephone line it is incurring telephone time charges, even if you are not sending any data. Use this key with caution; if you are in doubt or if your off-line work may take longer than you think, please terminate the call (with key <f8> and then call again later.

<SHIFT-f0> <80 column display>: This key can be entered at any time during an on-line connection to change the screen display size to 80 column format. Remember that it is possible to define the initial screen display format for each one of the six telephone choices (see section 7.2).

<SHIFT-f1> <40 column display>: This key can be entered at any time during an on-line connection to change the screen display size to 40 column format.

<SHIFT-f2> <40 column viewdata format>: This key has a similar effect to <SHIFT-f1>. The main difference is that the terminal is set to respond to the viewdata character set (which includes colours and graphics).

<SHIFT-f3> Not used at present.

<SHIFT-f4> <DISPLAY MESSAGES>: The purpose of this key is only to show on the screen (not send to line) the list of six character strings corresponding to function keys <f0> to <f5>.

<SHIFT-f5> <TRANSMIT FILE>: This key is used to transmit the contents of an existing disk text file to line. When the key is pressed, the message "Enter file name to transmit" will be displayed. Enter the name of the text file you want to transmit followed by a <CR>. The computer will reply with either "OK" or "File does not exist". If the file exists on the disk, it will be transmitted to line. When all the file has been transmitted, the computer will reply with "Disk file sent". You can now

resume normal work. If you are using the MAIL service, remember to type <CR>.SEND<CR> to ensure your message is sent. It is also possible to include a .SEND line of text within your original file. If you are using XMIT, the command sequence is <CR>.END<CR>.

<SHIFT-f6> <RECEIVE FILE>: This key is used to store all incoming text on a named disk file. When the key is pressed, the message "Enter filename to read" will be displayed. Enter the name of the file which you want to receive your text, remembering that the BBC only allows filenames of up to eight characters long. All received data will be saved to disk. When all required input has ceased and you want no more data to be saved to disk, enter the <f6> key to close the file. Remember that if the file is not closed at some stage all received data may be lost (see <f6>).

<SHIFT-f7> <PRINT ON>: All received text after this key is pressed will be sent to the printer. Use <f7> to switch the printer off. If the printer overprints on the same line (no line feeds) or the printer double line spaces, enter <CLT-f7> once to set the line feed allow-disable flag within the computer. If you had to do this to set the terminal to operate the printer properly, you must save this flag in the parameter file. This is done from the programming menu by entering "$". Please refer to section 3.5 PERIPHERAL FACILITIES PROGRAMMING.

<SHIFT-f8> <SCREEN PRINT>: Dump the contents of the screen to the printer. This key is different from <SHIFT-f7> above in that only the one page of information displayed on the screen will be printed.

APPENDIX B

THE FOLLOWING CODES ARE FOR THE BBC ONLY

shift <f9> <operating system command> allows direct access to the * commands in the BBC computer. Remember that some * commands (such as backup) will OVERWRITE memory and may crash the program.

<CTL f9> Similar to <shift f9> but the command string is taken from the contents of function key <f5>

<CTL f8> Save contents of screen to disk file TTNSDAT in ASCII format. This only works in 40 column view-data mode.

<CTL f7> Toggle printer LF character disable - see entry for <shift f2>.

<CTL f6> Toggle XON-XOFF transit flag.

<CTL f5> not used

<CTL f4> not used

<CTL f3> Set serial port to 75rx / 1200tx

<CTL f2> set serial port to 1200rx / 1200tx

<CTL f1 Set serial port to 1200rx / 75tx

<CTL fØ> Set serial port to 300rx / 300tx

The last three commands have meaning only if a modem other than that supplied is used. These keys allow the TTNS program to be used with other modems.

APPENDIX C

DOWNLOADING TEXT FROM MAIL OR DATABASE TO DISK

Ensure there is a disk on the drive. If the text to be downloaded is long, ensure that the disk is reasonably empty otherwise you may get a "DISK FULL" message half way through your work.

The general procedure to save a text file is as follows:

1. Sign on to the system and get to the section, page or message you want to save. Do not call the information yet.
2. Press <RX-FILE> (<SHIFT-f6> on the BBC). This opens a disk file for saving on the disk.
3. Enter a name of file for the text to be stored under. Any name will do as long as it has fewer than 8 characters.
4. Recall the data from line. Note the light on the disk drive comes on as the data is stored.
5. When all the data has been received, press <END-DISK> (<F6> on the BBC, to close the file.

The last operation (closing the disk file) is important, the program will store all incoming data to disk until the file is closed. The file will be closed automatically if the program is exited in the normal way, i.e. via one of the menus. If the program is aborted with the BREAK key, the disk directory may not be updated correctly and data may be lost on the disk.

UPLOADING TEXT FROM DISK TO SEND AS MAIL

To send the contents of a text file you already have on disk, enter <TX-FILE> (<SHIFT-f5> on the BBC) followed by the name of the file on the disk; terminate with a <CR>.

The file will now be transmitted on-line, with the contents echoed to the screen in double line spacing. (Text will, however, be stored correctly at the computer end.)

When all the file has been transmitted, a message will be displayed on the screen. Enter on the keyboard: <CR>.SEND<CR>

APPENDIX D

EXTERNAL FILES

CREATING FILES

The Text Editor System, when entered directly from system level with the command >ED allows you to create new Textfiles, or EDIT existing ones with the command >ED filename. These files are external to the mail system and are stored on your ID with a unique name. The file name may be up to 32 characters, the first of which must be alphabetic.

To create a text file, enter >ED. You will be put into INPUT mode, since the editor assumes you need this mode first. There are two modes, EDIT and Input. Input is used to enter text line by line, EDIT mode is used to locate a specific point in the text and to make corrections. You may switch modes by pressing TWO RETURNS, or one RETURN on a blank line. To avoid switching modes between paragraphs, put a space before the second RETURN.

The EDIT mode operates on a line by line basis. All commands given affect the line of text at which the computer is currently looking, or POINTING. The computer uses an imaginary POINTER to do this. The POINTER is always positioned at the last line of text and can be moved using various EDIT mode commands. Your text also contains null lines above and below the text. Thes are not actually part of the text but mark where a line may be inserted.

The EDIT mode commands are of three types

1. POINTER commands

TOP (t)	Move pointer to top of text.
BOTTOM (b)	Move pointer to bottom of text.
NEXT (n)	Move pointer down one line
NEXT6 (n6)	Move pointer six lines down (or any other number of lines down)
UP (u)	Move pointer up one line
UP5 (u5)	Move pointer up five lines (or up any other number of lines)
30	Move pointer to specific line.
LOCATE (lxx)	Move pointer to line containing xx. The computer always searches downward from the pointer line.

FIND (Fxx)	Move pointer to line beginning xx
WHERE (w)	Which line is the pointer on?

2. REVISION commands

CHANGE (c/xxx/yyy)	Changes characters from xxx to yyy. Entered as (C/mistake/correction)
DELETE (d5)	Delete a number of lines (e.g. 5) including pointer line.
INSERT (i abc)	Insert abc (a line of text) after pointer line
APPEND (a ttt)	Add ttt to end of pointer line
RETYPE (R wxyz	Replace pointer line with wxyz (new line of text)
OOPS	Forget last command entered (for example if you retype a line incorrectly, you can retrieve the original.)

3. Exit Commands

When you have completed your work, return to EDIT if you are in INPUT. Enter FILE ABCD, and the computer files your work under ABCD and returns you to system level. If you are editing an existing file, enter FILE without the filename. Entering QUIT returns you to system level without saving any of your work or amendments.

DOWNLOADING FILES

To download mail items to an external file:

.SAVE abc	save message as file called abc
.SAVE TEXT abc	save text only, eliminating headers
.SAVE IN abc	append message to end of existing file abc
.SAVE TEXT IN abc	append text only to existing external text file called abc

UPLOADING FILES

To upload the contents of an existing external file to send as a mail item, at the Text prompt, enter .LOAD abc where abc is the name of the file. The system will respond with "nn lines loaded". You may either add more to your message or use .S to send the file.

CHECKING FILES HELD ON YOUR ID

To list all files held on your ID, at system level (>), enter L.

To delete a file enter DEL filename at system level (>)

To display the contents of a textfile without editing, enter TY filename at system level (>).

APPENDIX E

RML KEY EQUIVALENTS

To obtain a function key, enter <CTL-8> (or F1 on the RML 480) followed by one of the following keys

1.	<f0>	!	<shift f0>
2.	<f1>	"	<shift f1>
3.	<f2>	#	<shift f2>
4.	<f3>	$	<shift f3>
5.	<f4>	%	<shift f4>
6.	<f5>	&	<shift f5>
7.	<f6>	'	<shift f6>
8.	<f7>	(	<shift f7>
9.	<f8>	)	<shift f8>
0.	<f9>	-	<shift f9>